

CLAIMS

1. A method of operation for an internal combustion engine having a crankshaft, a camshaft and a positionable phaser for changing a phase angle of the camshaft with respect to the crankshaft, the method comprising the steps of:
 - 5 receiving a series of crankshaft pulses representative of crankshaft rotation, and a series of camshaft pulses representative of camshaft rotation;
 - calculating a base offset cam phase using the crankshaft and camshaft pulses when said phaser is commanded to a reference position;
 - calculating a current cam phase using the crankshaft and camshaft pulses
 - 10 when said phaser is commanded to a position other than said reference position; and
 - determining a position of said phaser based on a deviation of said current cam phase from said base offset cam phase.

2. The method of operation of Claim 1, including the steps of:
 - storing said base offset cam phase at engine shut-down;
 - calculating sample base offset values using the crankshaft and camshaft pulses during a period following engine re-starting, and averaging said sample
 - 5 base offset values; and
 - comparing the stored base offset cam phase to the averaged sample base offset values, and initializing said base offset cam phase based on such comparison.

3. The method of operation of Claim 2, including the step of:
 - initializing said base offset cam phase in accordance with the stored base offset cam phase if there is substantial deviation between the averaged sample base offset values and the stored base offset cam phase.

4. The method of operation of Claim 2, including the step of:
initializing said base offset cam phase in accordance with the averaged
sample base offset values if the stored base offset cam phase is invalid.

5. The method of operation of Claim 1, including the steps of:
periodically calculating sample base offset values using the crankshaft
and camshaft pulses during operation of said engine when said phaser is
commanded to said reference position;
5 averaging said sample base offset values; and
updating said base offset cam phase in accordance with the averaged
sample base offset values.

6. The method of operation of Claim 5, including the step of:
rejecting sample base offset values falling outside a set of calibrated
thresholds.

7. The method of operation of Claim 5, including the step of:
updating said base offset cam phase by replacing said base offset cam
phase with the averaged sample base offset values.

8. The method of operation of Claim 1, including the steps of:
periodically comparing said base offset cam phase to a set of calibrated
thresholds defining a valid base offset range; and
disabling a control of said phaser if said base offset cam phase is outside
5 said valid base offset range.

9. The method of operation of Claim 1, wherein said engine includes a camshaft wheel having a plurality of teeth, and the camshaft pulses are produced in response to detected edges of said teeth, the method of operation including the steps of:

5 calculating a base offset cam phase for each of said plurality of teeth when said phaser is commanded to said reference position;

 calculating said current cam phase using a camshaft pulse associated with a selected tooth of said camshaft wheel when said phaser is commanded to a position other than said reference position; and

10 determining said position of said phaser based on a deviation of said current cam phase from a base offset cam phase calculated for said selected tooth.